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Daisuke Miura

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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

MALDONADO, JULIO J

ART UNIT

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2823

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

1. In response to applicant's telephone request regarding the last Office action, the following corrective action is taken.

The period for reply of 3 MONTHS set in said Office Action is restarted to begin with the mailing date of this letter.

Election/Restrictions

2. Applicant's election without traverse of claims 1-10 and 37 in the reply filed on 12/12/2007 is acknowledged.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a "layer composed of at least a polysiloxane compound, the layer being laminated on the organic semiconductor layer..." must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aramaki et al. (U.S. 7,193,237 B2, hereinafter Aramaki) in view of Kelley et al. (U.S. 6,617,609 B2, hereinafter Kelley).

In reference to claims 1, 5 and 37, Aramaki (Figs.1A-1D) teaches a field effect transistor having an organic semiconductor device comprising an organic semiconductor layer (1) containing at least porphyrin; and a gate dielectric layer (2) being laminated on or under the organic semiconductor layer (1) so as to be in intimate contact with the organic semiconductor layer (1), wherein said gate dielectric layer (2) is "...a material having an insulating property...such as polymethyl methacrylate, polystyrene, polyvinylphenol, polyimide, polycarbonate, polyester, polyvinyl alcohol, polyvinyl acetate, polyurethane, polysulfone, an epoxy resin or a phenol resin, a

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copolymer prepared by a combination thereof, an oxide such as silicon dioxide, aluminum oxide or titanium oxide, a ferroelectric oxide such as SrTiO_3 or BaTiO_3 , a nitride such as silicon nitride, a dielectric such as a sulfide or fluoride, or a polymer having such dielectric particles dispersed therein, may be mentioned..."

(Aramaki column 29, line 56 – column 30, line 40).

Aramaki fails to disclose wherein said layer having said insulating property is composed of at least a polysiloxane compound.

However, Kelly teaches an organic thin film transistor including an organic semiconductor layer and a dielectric layer adjacent to said organic semiconductor layer (Kelley, column 2, lines 50 – 59), wherein said organic thin film transistor further includes a polysiloxane compound interposed between said organic semiconductor layer and said gate dielectric layer (Kelley, column 2, lines 60 – 63).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Aramaki and Kelley to enable a polysiloxane compound between the organic semiconductor layer and the gate dielectric layer of Aramaki as taught by Kelley because this would control the interface between the organic semiconductor film and the gate dielectric layer and thus improving the properties of said organic thin film transistor (Kelley, column 1, lines 41 – 46).

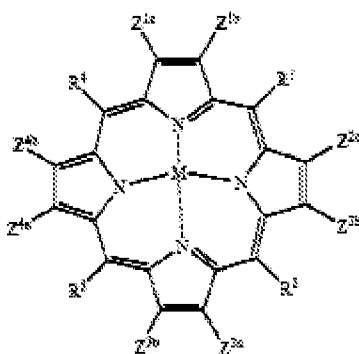
The combined teachings of Aramaki and Kelley fail to expressly disclose wherein said polysiloxane compound is a crystallization promoting layer. However, the same materials are treated the same way and therefore, the same result would be obtained.

Therefore, the polysiloxane compound of the combined teachings of Aramaki and Kelley is labeled a crystallization promoting layer.

In reference to claims 2 and 3, the combined teachings of Aramaki and Kelley teach wherein the polysiloxane compound has the general formula $-(\text{SiR}_1\text{R}_2\text{O})_n-$, "...wherein each R comprises, independently, a group selected from hydrogen, C.sub.1 -C.sub.20 aliphatic, C.sub.4 -C.sub.20 alicyclic, arylalkyl, or aryl, and a combination thereof which may contain one or more heteroatom(s) and/or one or more functional group(s). As used in this document, "heteroatom" means a non-carbon atom such as O, P, S, N and Si..." (Kelley, column 5, lines 11 – 32).

The combined teachings of Aramaki and Kelley fail to expressly disclose wherein the polysiloxane compound has the general formula $-(\text{O-SiR}_1\text{R}_2\text{-O-SiR}_3\text{R}_4)_n-$, $-(\text{O-SiR}_7\text{-O-SiR}_8\text{-O})_m-(\text{O-SiR}_9\text{-O-SiR}_{10}\text{-O})_n-$ or $-(\text{SiR}_{21}\text{R}_{22}\text{-O})_o-(\text{SiR}_{23}\text{R}_{24}\text{-O})_p-$. However, the polysiloxane disclosed in the combination of Aramaki and Kelley is open to have polysiloxane compounds with the claimed general formulas. Therefore, the combined teachings of Aramaki and Kelley inherently teach the claimed limitations.

In reference to claim 4, the combined teachings of Aramaki and Kelley teach wherein the porphyrin compound is represented by the general formula:



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wherein each of Z^{ia} and Z^{ib} ($i=1$ to 4) represents a monovalent organic group, and Z^{ia} and Z^{ib} may be bonded to form a ring, wherein said monovalent organic group may, for example, be a hydrogen atom, a hydroxyl group, a C_{1-10} alkyl group which may be substituted, an alkoxy group, a mercapto group, an acyl group, a carboxyl group or its ester with a C_{1-10} alcohol, a formyl group, a carbamoyl group, a halogen atom such as fluorine, chlorine, bromine or iodine, an amino group which may be substituted by a C_{1-10} alkyl group, or a nitro group, and such a group may further have a substituent, wherein Z^{ia} and Z^{ib} are bonded to form a ring, the ring formed by the structure $Z^{ia}-CH=CH-Z^{ib}$, may, for example, be an aromatic hydrocarbon such as a benzene ring, a naphthalene ring or an anthracene ring, a heterocyclic ring such as a pyridine ring, a quinoline ring, a furan ring or a thiophene ring, or a non-aromatic cyclic hydrocarbon such as a cyclohexene, wherein each of R^1 to R^4 is a hydrogen atom or a monovalent organic group such as an alkyl group which may be substituted, an aryl group, an alkoxy group, a mercapto group, an ester of a carboxyl group with a C_{1-10} alcohol, or a halogen atom and wherein M is a bivalent metal atom, such as Zn, Cu, Fe, Ni or Co, for example (Aramaki, column 10, line 46 – column 11, line 54).

In reference claim 6, the combined teachings of Aramaki and Kelley substantially teach all aspects of the invention but fail to disclose wherein the aromatic ring formed by the at least one pair of the adjacent R_{11} in the general formula is obtained by heating a precursor having a bicyclo[2, 2, 2] octadiene skeleton structure.

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of

a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., In re Garnero, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979). Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983).

Allowable Subject Matter

6. Claims 7-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. Applicants are encouraged, where appropriate, to check Patent Application Information Retrieval (PAIR) (<http://portal.uspto.gov/external/portal/pair>) which provides

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applicants direct secure access to their own patent application status information, as well as to general patent information publicly available.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Julio J. Maldonado whose telephone number is (571) 272-1864. The examiner can normally be reached on Monday through Friday.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571) 272-1907. The fax number for this group is 571-273-8300. Updates can be found at <http://www.uspto.gov/web/info/2800.htm>.

Julio J. Maldonado
Patent Examiner
Art Unit 2823

Julio J. Maldonado
January 24, 2008

/Matthew S. Smith/

Supervisory Patent Examiner, Art Unit 2823